



Vocabulary

Review

1. Underline the correct choice to complete the sentence.

Rigid motions and *dilations* both preserve angle measure / distance.

2. Fill in the blanks with one of the following words to complete the sentence.

rigid motions

dilations

 preserve **distance**; do **not** preserve **distance**.

3. Define similar polygons on the lines below.

Vocabulary Builder

Similar (noun) sim ə lər

Related Words: corresponding sides, corresponding angles, scale factor

Definition: Two figures are **similar** if and only if there is a similarity transformation that maps one figure onto the other.

Example: When a figure is transformed by a **similarity transformation** (a composition of rigid motion and dilation), a **similar** figure is formed.

Use Your Vocabulary

4. The image length of a dilation is 5 cm and the corresponding preimage length is 2 cm. Circle the scale factor of the dilation.

$\frac{1}{5}$ $\frac{2}{5}$ $\frac{5}{2}$ $\frac{5}{1}$

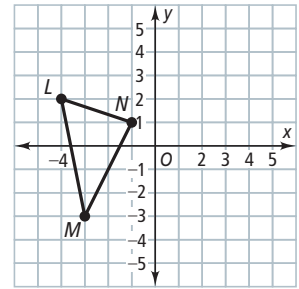
5. The scale factor of a dilation is $\frac{2}{3}$. An image length is 4 ft. Circle the corresponding preimage length.

2 ft 3 ft 4 ft 5 ft 6 ft



Problem 1 Drawing Transformations

Got It? Triangle LMN has vertices $L(-4, 2)$, $M(-3, -3)$, and $N(-1, 1)$. Suppose the triangle is translated 4 units right and 2 units up and then dilated by a scale factor of 0.5 with center of dilation at the origin. Sketch the resulting image of the composition of transformations.



Fill in the blanks to complete the statements.

6. Step 1: Draw $T(\triangle LMN)$

$$T(x, y) = (x + 4, y + 2)$$

$$T(L) = L'(\quad, \quad) \quad T(M) = M'(\quad, \quad) \quad T(N) = N'(\quad, \quad)$$

Sketch $L'M'N'$.

7. Step 2: Draw the dilation of $L'M'N'$

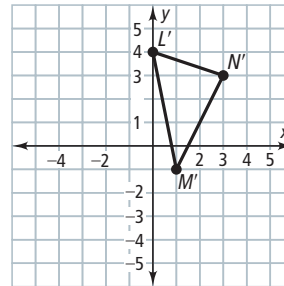
$$D_{0.5}(x, y) = (0.5x, 0.5y)$$

$$D_{0.5}(L') = L''(\quad, \quad)$$

$$D_{0.5}(M') = M''(\quad, \quad)$$

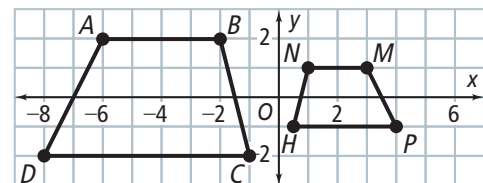
$$D_{0.5}(N') = N''(\quad, \quad)$$

Sketch $L''M''N''$.



Problem 2 Describing Transformations

Got It? What is a composition of rigid motions and a dilation that maps trapezoid $ABCD$ to trapezoid $MNHP$?



8. Use the information in the problem to complete the problem-solving model below.

Fill in the blanks to complete the statements.

Know

Preimage	image
A (,)	M (,)
B (,)	N (,)
C (,)	H (,)
D (,)	P (,)

Need

You need to determine which happened.

- ☐ Reflection
- ☐ Rotation
- ☐ Translation
- ☐ Dilation

Plan

Choose 2 points and follow their movement from preimage to image.

9. Follow the Plan. Use preimage points A and D . Circle the corresponding points in the image.

Point A corresponds with: Point M Point N Point P.

Point D corresponds with: Point H Point M Point P.

10. Underline the correct choice to complete each sentence.

Segment AD is located on the right / left of figure $ABCD$.

Segment MP is located on the right / left of figure $MNHP$.

11. Circle the one transformation you can use on $ABCD$ so that AD is parallel to MP and the corresponding points are located in the correct quadrant.

dilation reflection rotation translation

12. Underline the correct choice to complete each sentence.

Trapezoid $ABCD$ is larger / smaller / the same size as $MNHP$.

To map $ABCD$ onto $MNHP$, I need to duplicate / enlarge / reduce $ABCD$ by performing a reflection / rotation / translation / dilation.

The scale factor is 0.5 / 2 / 4.

13. To map $ABCD$ to $MNHP$, begin by $ABCD$ across $x =$. Then perform a on $A'B'C'D'$ using a scale factor of .

Compositions of rigid motions and dilations form a special class of transformations. These transformations that map preimages to similar images are called **similarity transformations**.

take note

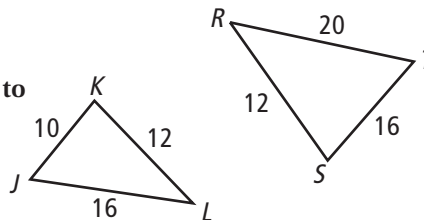
Similar Figures

Two figures are **similar** if and only if there is a similarity transformation that maps one figure onto the other.



Problem 3 Finding Similarity Transformations

Got It? Is there a similarity transformation that maps $\triangle JKL$ to $\triangle RST$? If so, identify the similarity transformation and write a similarity statement. If not, explain.



14. Use information from the diagram to complete each statement.

$JK =$ $KL =$ $LJ =$ $RS =$ $ST =$ $TR =$

15. Underline the correct word to complete each sentence.

Corresponding sides of similar figures are congruent / proportional.

To determine if corresponding sides are proportional, set up a proof / proportion.

16. Circle the proportion you could use to determine if the triangles are similar.

$$\frac{JK}{RS} = \frac{KL}{RT} \quad \frac{JK}{RS} = \frac{ST}{RT} \quad \frac{JK}{RS} = \frac{KL}{ST}$$

17. Substitute values into the proportion you circled in Exercise 16. Simplify the proportion, then write $=$ or \neq between the ratios.

$$\frac{\text{ }}{\text{ }} = \frac{\text{ }}{\text{ }} \quad \text{Simplify: } \frac{\text{ }}{\text{ }} = \frac{\text{ }}{\text{ }}$$

18. Underline the correct choices to complete each sentence.

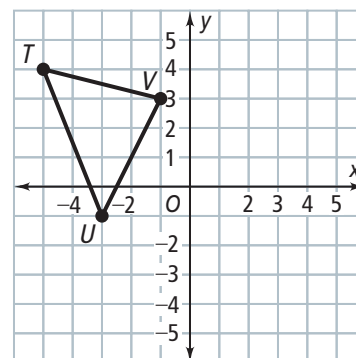
Corresponding sides are/are not proportional, so $\triangle JKL$ and $\triangle RST$ are/are not similar.

There is / is not a similarity transformation that will map $\triangle JKL$ to $\triangle RST$.



Lesson Check • Do you UNDERSTAND?

Open Ended For $\triangle TUV$ shown at the right, give the vertices of a similar triangle after a similarity transformation that uses at least 1 rigid motion.



19. Find the vertices of the preimage of $\triangle TUV$.

$T(\text{ }, \text{ })$ $U(\text{ }, \text{ })$ $V(\text{ }, \text{ })$

20. When a triangle is reflected across a line, what happens to the corresponding angle measures and the length of the corresponding sides of the image triangle?

21. Write the coordinates of the reflection of $\triangle TUV$ across the y -axis.

$$R_{y\text{-axis}}(x, y) = (-x, y)$$

$$R_{y\text{-axis}}(T) = T'(\text{ }, \text{ })$$

$$R_{y\text{-axis}}(U) = U'(\text{ }, \text{ })$$

$$R_{y\text{-axis}}(V) = V'(\text{ }, \text{ })$$

22. When a triangle is dilated by a scale factor, what happens to the corresponding angle measures and the length of the corresponding sides of the image triangle?

23. Draw the dilation of $\triangle T'U'V'$ using a scale factor of 0.5 and the origin as the center of the dilation. $D_{0.5}(x, y) = (0.5x, 0.5y)$

$$D_{0.5}(T') = T''(\text{ }, \text{ }) \quad D_{0.5}(U') = U''(\text{ }, \text{ }) \quad D_{0.5}(V') = V''(\text{ }, \text{ })$$



Math Success

Check off the vocabulary words that you understand.

☐ similarity transformation ☐ similar

Rate how well you can *identify similarity transformations*.

